

**Work Order ID 58499**

May 7, 2010 2:25:01 PM



Page 1

Item ID: D205-634-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 07/05/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 24/05/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date: 10-5-09

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Draw Nbr	Revision Nbr
D2580	Rev D

100



0.00

DOCUMENT CONTROL

DC

Memo

0.00

Document Control

Photocopy D205-634 bluefile &amp; type labels per PPP D205-634-041 CHG002

110



0.00

BENDING MACHINE - SKIDTUBES

CNC Bend I

Memo

0.00

CNC Delta 100 Bender

1-Bend as per program D2580.C on CNC Bender and Folio FT009

2-Cut tubes as per Dwg. D2580

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
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Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

120



Skidtubes

Operation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

0.00

J

- -

AWM  
10-5-13

Skidtubes

Memo

0.00

Skidtubes

1- Deburr ends

2- C'sink holes as per dwg without cutting fluid

3- Prepare tube for welding, remove alodine as required.

4- Scribe batch number insied aft end of tube.

130



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

(1)

RE 10/05/14

W/O:		WORK ORDER CHANGES					
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Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

140



Skidtubes

Operation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Memo

0.00

1-Weld step D2576 as per Dwg. D2580 and QSI 004  
A/R□□□ Aluminum RodM112860

BE 10/05/14

2-Prep per QSI 005 and weld crossbolt spacers D2579 as per Dwg. D2580, QSI 004.

For D2579 spacers, weld one side, pass 3/8" drill, weld other side, pass 3/8" drill  
A/R□□□ Aluminum RodM112860

BE 10/05/14

3-Grind welds as per Dwg D2580 Grind flush ridge made from bending

4-Drill holes for wearplates using DT 8217 & DT8937 Open holes to 19/64",  
adjust stopper not to hit web. Deburr

M 10/5/17

5-Counterbore crossbolt spacers to 7/16" ID x 1.0" deep as per Dwg D2580.  
Deburr holes

M 10/5/18

6-Drill pilot holes for aft cap using DT 8215Open holes to 0.208". Deburr

M 10/5/17

7-Drill pilot holes for Tow ring using DT8091, open to .640"and Deburr

M 10/5/18

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Process Plan:

Date:

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

150



QC

Quality Control

Operation  
Description

QC10- Inspect visual per QSI004- ground welds

Set Up/  
Run Hours

0.00

S wlosie

Draw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

160



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

S wlosie

0.00

(4)

170



HandFinish

Pressure Wash per QSI005 4.3

0.00

0.00

Memo

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch and leave fwd cap out of solution.

O BK 10-5-19.

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Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

180



Powdercoat

Operation  
Description

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

M1114209

Set Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

0.00

2/10/05/19

1 0

Powder Coating

Memo

0.00

START TIME: 11:00AM  
OVEN TEMPERATURE: 320°F  
FINISH TIME: 11:30AM

190



QC

Quality Control

QC3- Inspect Part Finish

0.00

Memo

0.00

BL 10-5-20

W/O:		WORK ORDER CHANGES					
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Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

200

Operation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

HandFinish

Hand Finishing

Memo

0.00

1-Install inserts &amp; wearplates &amp; Gaskets as per Dwg. D2580. Use a drop of Sikaflex on insert holes before installing wearplates

A/R   Sikaflex-291  *1124109*Sikaflex expire date: *10/08*

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2580 and seal Fwd Step &amp; Aft Cap with Sikaflex. Clean excess adhesive

A/R   Sikaflex-291  *1124109*Sikaflex expire date: *10/08*

5-Wing Walk as per Dwg D2580 and QSI 005 4.4

Batch: *1124132*
*D BK 10-5-20*

W/O:		WORK ORDER CHANGES					
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Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

210



QC

Quality Control

Operation  
Description

QC5- Inspect part completeness to step on W/O

Set Up/  
Run Hours

0.00

Draw  
Number

Rev.

Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

S 10/05/25

40

220



Packaging

Packaging

Packaging

0.00

Memo

0.00

Identify and pack for shipping as per PPPD205-634-041

Location:

PPP Rev: PPA 58-219

230



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

W/O:		WORK ORDER CHANGES					
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Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
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Parent Item: D205-634-041



Parent Item Name: Replacement Skidtube

Start Date: 07/05/2010

Required Date: 24/05/2010

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ

Start Qty: 1.00

Required Qty: 1.00

IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD

IPP Rev. O 06.02.28 Added paperwork EC

IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

D2580-1



Manufactured No

110

Each

9.0000

1



205 Skidtube bent detail

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>	
LG	9		1358385 D 11/25/13
57028	1		
57347	1		
57902	1		
57938	2		
58090	2		
58112	2		

D2576-3



Manufactured No

140

Each

110.0000

1



Step (machining detail)

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	110	
46661	62	
52215	48	

D2579



Manufactured No

140

Each

193.0000

20



Crossbolt Spacer

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
LG	193	
57052	13	
57348	180	

20 BE 10/05/14

W/O:		WORK ORDER CHANGES					
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Start Qty: 1.00

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IPP Rev. O 06.02.28 Added paperwork EC

IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Required Qty: 1.00

D2855



Manufactured No

200

Each

105.0000

1



Cap

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
FP6	2	
56613	2	
ST026	103	
50513	" 1	
50770	29	
51539	19	
53791	54	

1 BL 10-5-20

AN3-5A



Purchased No

200

Each

963.0000

2



Bolt

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST350	963	
105057	963	

2 BL 10-5-20

AN960JD10L



Purchased No

200

Each

4,297.000

2



Washer

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST348	4297	
110985	4297	

2 BL 10-5-20

ALS7-1032-130



Purchased No

200

Each

17.0000

50



Insert

ALS7-1032-130 (114654)  
50

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST282	17	
113238	17	

50 BL 10-5-20

W/O:		WORK ORDER CHANGES					
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IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Required Qty: 1.00

AN3C4A



Purchased

No

200

Each

1,939.000

50



BOLT

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
ST350	1939	
114103	501	
114108	300	
114416	138	
114523	1000	

50 Bl 10-5-20

50 Bl 10-5-20

AN960C10L



Purchased

No

200

Each

0.0000

50



washer

D3566-13



Manufactured

No

200

Each

33.0000

1



Gasket

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
FP	33	
53461	33	

1 Bl 10-5-20

D3566-5



Manufactured

No

200

Each

21.0000

1



Gasket

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
FP015	21	
57526	1	
57682	20	

1 Bl 10-5-20

W/O:		WORK ORDER CHANGES					
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IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

D3566-1



Manufactured No

200

Each

41.0000

2



Gasket

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP015	41	
57715 ✓	20	
58182	21	

BL 10-5-20

D3564-11



Manufactured No

200

Each

9.0000

1



Wearshoe

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP019	9	
57957 ✓	9	

BL 10-5-20

D3564-13



Manufactured No

200

Each

27.0000

1



Wearshoe

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP17	27	
56533 ✓	1	
57684 ✓	12	
57922	14	

BL 10-5-20

W/O:		WORK ORDER CHANGES					
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IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

Required Qty: 1.00

D3564-9



Manufactured No

200

Each

22.0000

1



Wearshoe

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP	1	
55334	1	
FP019	21	
57685 ✓	7	
57958 ✓	14	

1 Bl 10-5-20

D3564-5



Manufactured No

200

Each

7.0000

1



Wearshoe

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FG	1	
34806	1	
FP19	6	
57525 ✓	1	
57729 ✓	5	

1 Bl 10-5-20

D2594-3



Manufactured No

200

Each

407.0000

16



O-Ring, 205 Skidtube

<u>Location</u>	<u>Loc Qty</u>	<u>Loc Code</u>
-----------------	----------------	-----------------

FP	407	
55546 ✓	19	
58191 ✓	388	

16 Bl 10-5-20.

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Picklist Print

May 7, 2010, 2:25:05 PM

Page 6

Work Order ID: 58499



Parent Item: D205-634-041



Parent Item Name: Replacement Skidtube

Start Date: 07/05/2010

Required Date: 24/05/2010

Comments: IPP Rev:N 02.08.28 FP was QC5 in Step 27; Added QC5 to Step 30 KJ

Start Qty: 1.00

IPP Rev P 10.02.19 per PAR09-043 EC verified by:DD

Required Qty: 1.00

IPP Rev. O 06.02.28 Added paperwork EC

IPP Rev:P 07-07-09 SS Wearplates & Gaskets JLM

D2594-1



Manufactured No

200

Each

382.0000

16



Plug, 205 Skidtube

Location	Loc Qty	Loc Code
FP	382	
42807	112	
55002	128	
57826	142	

584B4

16. Bl 10-5-20.

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**DART**

DESIGN <i>#</i>	DRAWN BY <i>RH</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D2580	REV. D SHEET 1 OF 3
DATE 07.02.27		TITLE 205 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.26	REDRAWN, INCLUDED DEO 9094/9097	
D	07.02.27	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124/9183	

**RELEASED**  
*07-06-28 #*

QTY -041	QTY -045	Part Number	Description
X		D2580-041	SKIDTUBE ASSEMBLY
	X	D2580-045	SKIDTUBE ASSEMBLY
1	1	D2500-1-190	EXTRUSION
1	1	D2576-3	STEP
20	24	D2579	CROSS BOLT SPACER
16	16	D2594-1	PLUG
16	16	D2594-3	O-RING
1	1	D2596	205 WEB
1	1	D2855	AFT CAP
1	1	D3564-5	WEARSHOE
1	1	D3564-9	WEARSHOE
1	1	D3564-11	WEARSHOE
1	1	D3564-13	WEARSHOE
2	2	D3566-1	GASKET
1	1	D3566-5	GASKET
1	1	D3566-13	GASKET
50	50	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AEELS-1032-130	INSERT
50	50	AN3C4A	BOLT
2	2	AN3-5A	BOLT
50	50	AN960C10L	WASHER
2	2	AN960JD10L	WASHER

SHOP COPY  
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UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 58499

*PJ 10-5-07***GENERAL NOTES:**

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2596 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0:200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-205 TO LOCATE AND DRILL Ø0.297 HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (50 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:  
SEE NOTES ON  
PAGE 2 FOR D2580-041 AND  
PAGE 3 FOR D2580-045
- 8) INSERT D2594-1 PLUG C/W D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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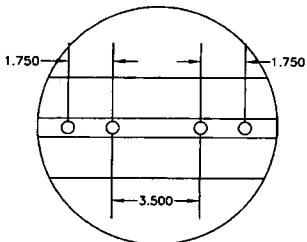
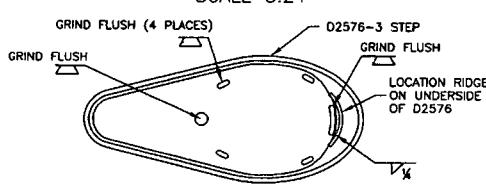
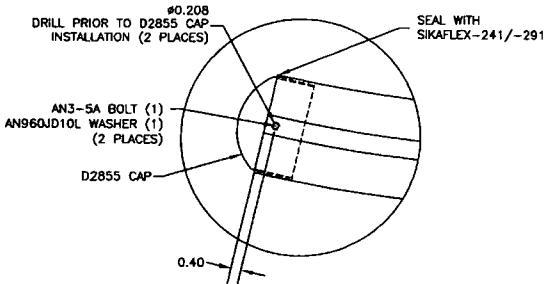
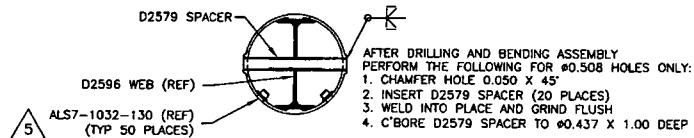
Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

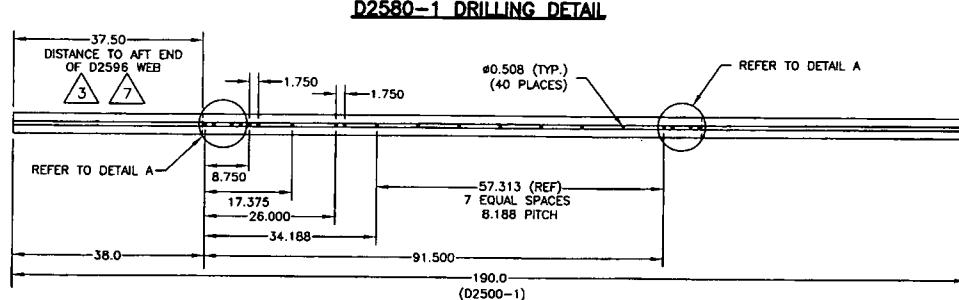
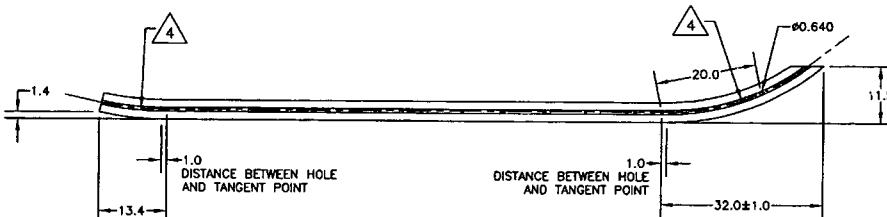
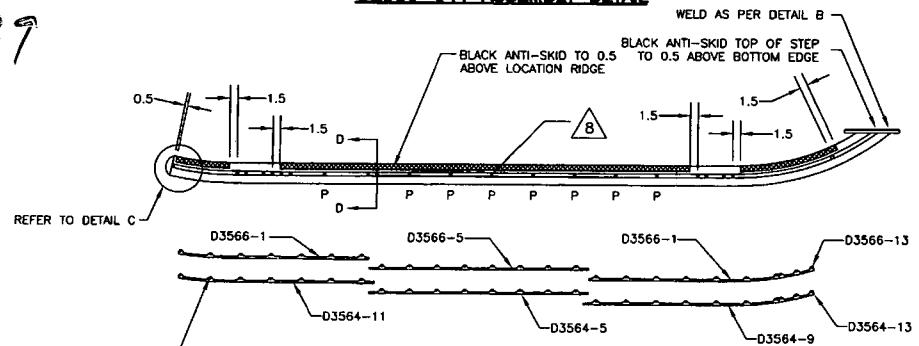
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 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**DETAIL A**  
SCALE 5:24**DETAIL B**  
SCALE 5:24RELEASED  
07-06-28**DETAIL C**  
SCALE 5:24**SECTION D-D**  
SCALE 5:24**D2580-041 NOTES**

i) FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB  
POWDER COAT ASSEMBLY GLOSS WHITE (REF. 4.3.5.1) PER DART QSI 005 4.3  
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4

**D2580-1 BENDING AND CUTTING DETAIL****D2580-041 ASSEMBLY DETAIL**AN3C4A BOLT (1)  
AN960C10L WASHER (1)  
(50 PLACES)

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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAWKSBURY, ONTARIO, CANADA
CHECKED	APPROVED		REV. D
		D2580	SHEET 2 OF 3
DATE	TITLE		SCALE

07.02.27 205 SKIDTUBE ASSEMBLY

1:24

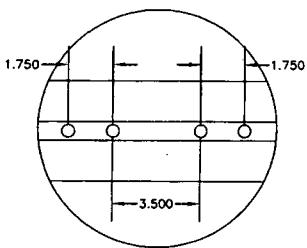
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

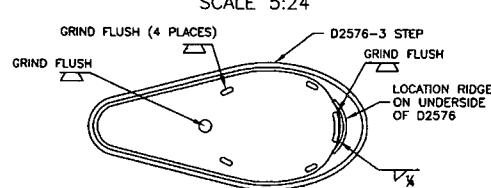
NOTE: Date & initial all entries

**DETAIL E**  
SCALE 5:24

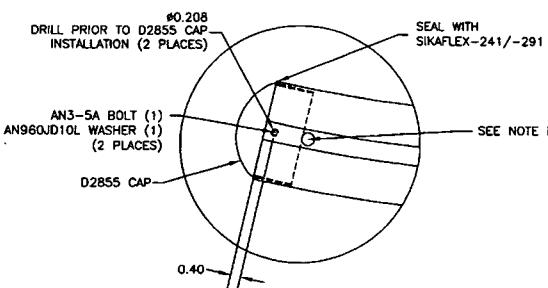


**RELEASED**  
07.16.28

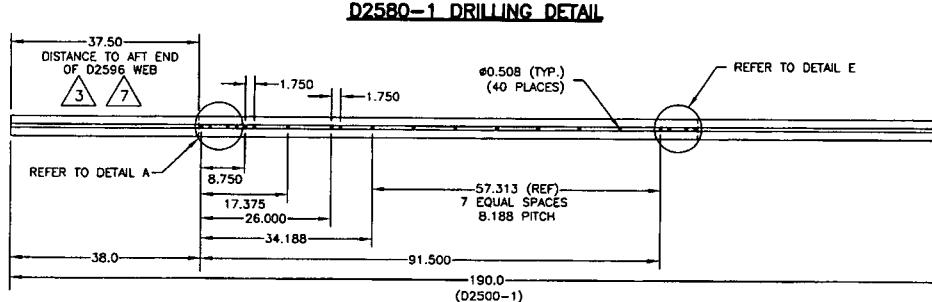
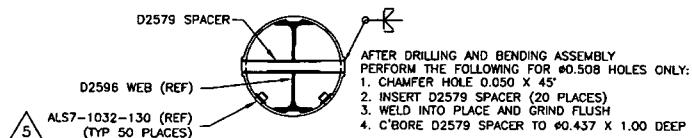
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SCALE 5:24



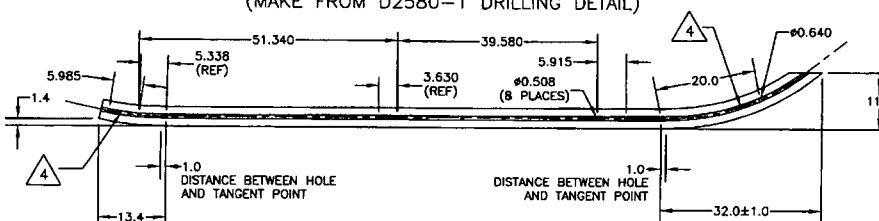
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SCALE 5:24



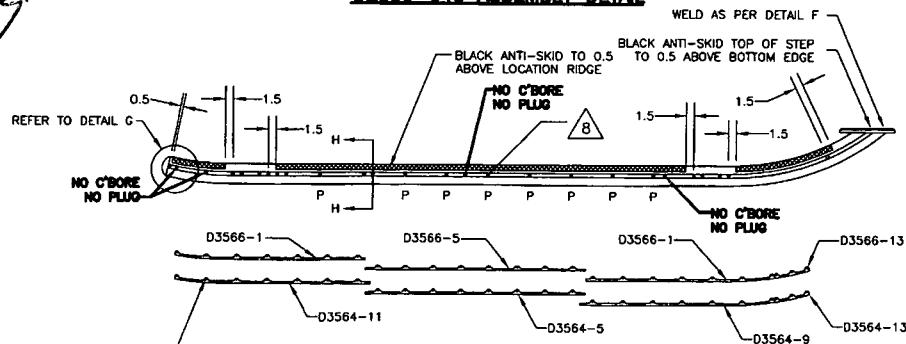
**SECTION H-H**  
SCALE 5:24



**D2580-5 BENDING AND CUTTING DETAIL**  
(MAKE FROM D2580-1 DRILLING DETAIL)



**D2580-045 ASSEMBLY DETAIL**



**D2580-045 NOTES**

- FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB  
POWDER COAT ENTIRE ASSEMBLY GREEN (REF. 4.3.5.8) PER DART QSI 005 4.3  
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- IT IS ACCEPTABLE TO GRIND A RELIEF IN THE D2855 AFT CAP TO PREVENT INTERFERENCE WITH THE SPACER AT THIS LOCATION

AN3C4A BOLT (1)  
AN960C10L WASHER (1)  
(50 PLACES)

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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HAWKSBURY, ONTARIO, CANADA
PH	PH	DART	REV. D
CHECKED	APPROVED	D2580	SHEET 3 OF 3
DATE	TITLE	07.02.27	205 SKIDTUBE ASSEMBLY

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 200

AWS D17.1.2001  
QUALIFICATION TEST RECORD

Name: Brian Elliott  
Job number: 576430  
Part number: 5205-634-041  
Description: 205 skid tube  
Welding Process: Tig[] Mig[]  
Base material: Aluminum  
Current: AC[] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[] fail[]  
Penetration: pass[] fail[]

UNACCEPTABLE

Cracks: pass[] fail[]  
Undercut: pass[] fail[]  
Pin holes: pass[] fail[]  
Overlap (cold lap) pass[] fail[]  
Porosity (surface): pass[] fail[]  
Coloration: pass[] fail[]

Qualifier Brian Elliott Date of Test Coupon 10.04.27

Welder Brian Elliott Date of Test Coupon 10.04.27

The above named individual is qualified in accordance with AWS D17.1.2001 to weld